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**TECHNICAL REVIEW OF SITES 2 AND 9
SITE INVESTIGATION
INSTALLATION RESTORATION PROGRAM
NAVAL AIR STATION
GLENVIEW, ILLINOIS
DECEMBER 1993**

WW Engineering & Science (WWES) has completed review of a portion of the SI report for the Glenview Naval Air Station (NAS) dated 8/11/93. The sections reviewed to date are: 1.0 Introduction, 2.0 Existing Site Conditions, and 3.0 Technical Approach of Section I - Background; and Section 2.0 and 9.0 of Section II - Site Investigations. Brief summaries and comments on these sections are found below.

BACKGROUND INFORMATION

The SI was conducted to provide additional data at 9 sites within the NAS. The PA was conducted in January 1988. A SI was recommended at 9 separate sites to define past waste operations and present conditions. The SI was conducted according to the Plan of Action (POA) prepared 4/18/90. The stated objectives of the SI were to characterize the nature and extent of risk that contaminants pose, evaluate on-site and off-site migration potential, and determine the need to proceed with a RI/FS.

The site is located 20 miles NW of Chicago, 5 miles from Lake Michigan. The NAS consists of 1,113.5 acres, was commissioned in 1937, and is used for Naval Air Reserve Training.

Potentially hazardous activities at the NAS include storage and use of aviation fuel and use/disposal of hazardous materials and petroleum wastes. Most hazardous materials are currently accumulated in 5 and 55 gallon drums. Full drums are placed in a storage area near Site 3. The NAS is a Class II generator per 351AC722 with 100 to 1,000 kg/month of waste consisting of petroleum, paint, thinners, solvents, adhesives, pesticides, lead/acid batteries, and lead wastes. Fuels used include jet fuels, turbine fuels, diesel fuels, and gas turbine fuels.

COMMENTS

Section 2.2.1, page 8. The presence of wetlands on the site is discussed. It is stated that any potential impact to these areas would be by transport via surface water. Was the potential for migration to wetland areas via ground water considered?

Section 2.3.2, figure III. The site location should be shown on Figure III.

Section 2.3.3, page 11 and Section 3.2.3, Page 22. We did not receive a copy of the NAS Base map (Attachment 1). Does the map adequately detail the site drainage system?

Section 2.3.3, Figure IV, Page 12. The report should define the criteria for identifying "severe soil conditions". The figure should provide a reference.

All Site Figures. The branches to Chicago River should be more clearly indicated on site maps. A label is present but the location of the river is not shown.

Section 2.3.3, figure V. A reference should be provided for identification of flood plains.

Section 2.3.4, page 16. The report should discuss the uppermost bedrock formations and figure VI should indicate the uppermost formation in the area of the site.

Section 2.3.4, Figures VI and VII. All figures derived from the literature, such as figure VI and VII, should include reference citations.

Section 2.3.5, page 18. The hydrogeology section should be expanded. Ground water flow directions and potentiometric levels in the bedrock aquifers should be discussed. A map with well locations near the site should be prepared. The discussion of hydrogeology of the glacial material should be greatly expanded. There is no discussion of site specific hydrogeology, anticipated flow directions, vertical hydraulic gradients, depth to uppermost aquifer at the site, or hydraulic conductivity. Have there been any deep holes drilled on the site to identify potential aquifers? The results of borings at each site should be discussed in the context of the interpretation of the site-wide hydrogeology.

Section 2.3.5, page 19. Previous borings were drilled for possible housing development and water levels were recorded in the borings. The water levels in these and other borings should be discussed and the logs should be included in the report. The report claims that all ground water encountered at the site is "perched" water. Given the nature of the unconsolidated material, flat topography, and poor drainage, the top of the saturated zone at the site probably occurs within a few feet of the surface. It is likely that the complete sequence of unconsolidated material is saturated. "Free" ground water is not encountered because of the low conductivity of the deposits. The use of the term "perched" is not appropriate in this setting. The report needs to expand discussion of occurrence of ground water and interpretation of the shallow ground water system. The report states that SI investigations were conducted in fall and winter and insufficient ground water was encountered at most of the sites for well installation. It is stated that sufficient ground

water may be present in the spring to warrant installation of wells at other sites if further study is deemed necessary. The criteria for this determination should be discussed for each site.

Sections 3.1 through 3.2.4. For sake of completeness, field methods should be summarized in greater detail rather than referring to the SOPs in POA for details.

Section 3.2, page 22. Chain of custody forms should be included in the report

Section 3.2.1, page 22. Was any field screening performed to guide selection of soil samples for lab analysis?

Section 3.3, page 23. It is noted that holding times were exceeded and resampling was required. The date of collection, holding time, and date of analysis should be supplied in summary tables for all samples which exceeded holding times. The tables should indicate which samples are considered semi-quantitative due to exceedance of holding times.

Section 3.4, page 24. Contaminants "typical of lab artifacts" were detected in various blanks. The detection of the same contaminants in samples was not considered significant unless the sample concentrations were at least 10 times the blank concentrations. This is only appropriate for four common lab contaminants (methylene chloride, acetone, MEK, and toluene) per U.S. EPA Guidance. Detection of any other contaminants in the site samples should be considered significant if five times greater in concentration than blank samples. Significant concentrations of contaminants other than the four common laboratory contaminants may indicate inadequacies in the field sampling and handling procedures. Blank concentrations above regulatory action levels will necessitate additional sampling with better QA/QC to verify site conditions.

Section 3.4, pages 24 and 25. The discussion of a reference (presumed to mean background) sample is unclear and incomplete. How was a single reference sample created from samples collected from Sites 1 through 5? Where were reference samples collected? What was criteria for assuming these samples represent background conditions? The statistical method used must be discussed. The assumptions for normally distributed and tightly clustered data need to be verified.

The report states that sample results were compared to background and were considered statistically representative (meaning significant?) if contaminants were at least 3 times those in the reference samples. What is the basis for using this criteria?. Until this section is greatly expanded and the methods justified, any conclusions from comparing sample data to the reference (background?) are invalid.

Section 3.3, Page 24. For ground water the reference should be Illinois Pollution Control Board Ground Water Quality Standards, 11/07/91, Section 620.410 (Class I: Potable Resource Ground Water). A case must be made on a site-specific basis for a Class II object based on the criteria established by IEPA. We are not aware that Class II status has been granted. The criteria for soils follows that of the ground water.

COMMENTS ON SITE 2 - WESTERN OLD BURN AREA NO. 1

History

Site was used from 1937-1963 to dispose of both hazardous and non-hazardous wastes. Wastes were burned from 1945-1963 and ash was covered with soil. Wastes included, among others, rubbish, oils, hydraulic fluids, chlorinated solvents, paint wastes (MEK), and fuels. Site was soil covered and vegetated in 1963. Filling activities also likely took place. Approximately 5 feet of "cover" was added based on topography and aerial photos. Land use is residential to the north and east and light commercial to the south and west. Site currently used for construction equipment and materials (stone and brick) storage. The primary objective was to characterize shallow contamination and establish vertical extent.

Section 2.1.1, 1st paragraph. What waste disposal activities occurred between 1937 and 1945 if burning began in 1945?

Section 2.1.1. A map showing detailing land use adjacent to Site 2 should be provided to better evaluate potential migration receptors.

Section 2.1.1. In 1989, 10 borings were completed at Site 2 to 10 feet and 19 samples were analyzed. Volatiles and semivolatiles were found in all samples with the highest levels noted for the deepest samples. The maps for Site 2 should show all previous (10) boring locations. Logs for all previous borings should be included. The text indicates lab data from all previous borings are in the Appendix. However, the data are not included and concentrations are not discussed with any detail.

Section 2.1.3, page 69. Reference is made to Figure 3 for justifying boring locations. This figure is not in the report. It cannot be determined if the boring locations were appropriate. A reference (background?) sample was collected to the northwest of Site 2. What is the basis for assuming that this sample represents background? It is stated that some of the contaminants may be mobile and may have migrated from the immediate area. This implies that migration to the location of the reference sample may have occurred.

Section 2.2.2. Samples from the borings were analyzed in range of 10 to 19 feet. The background sample was collected from 5 to 7 feet. Was there a possibility that the shallower background sample would contain greater contamination than the deeper samples from other borings?

Section 2.4.1.1, page 71. As stated in the report, the reference sample at Site 2 is not an appropriate background sample because it contained contaminants at levels similar to samples from the other four borings. The location of this sample is within the area of impact. Therefore, data from the borings was compared to the NAS composite reference sample rather than the site-specific reference sample (SB020505).

Section 2.4.1.2, page 72. For clarity, a summary table of all detected organics should be prepared. The format of the tables in the appendix is difficult to follow. The text indicates that several lab blanks were run for volatiles and the many of the parameters detected in the samples were also detected in the lab blanks. Data for the lab blanks should be included in the report. Laboratory data sheets for all analyses should be presented. The statement that levels in samples did not significantly exceed those of the blanks cannot be verified. Some of the detections of acetone and methylene chloride in the lab data table are flagged as being detected in the blanks while others are not. Most of the detections are flagged as being below the contract required detection limit (CRDL). The CRDL and the instrument detection limit should be specified for each parameter.

The semivolatile data are considered semi-quantitative due to out of control conditions. Conclusions based on these data are tentative at best. Detected parameters include 2-methylnaphthalene, naphthalene, phenanthrene, di-n-butylphthalate, and bis-(2-ethylhexyl)phthalate.

Section 2.4.1.3, page 73. Metals results are compared to the NAS composite reference sample. Because of uncertainties regarding the validity of the composite reference sample (discussed above) these comparisons have little meaning. Data should be compared to some other relevant standard. Furthermore, mercury was detected (0.05 to 0.06 mg/L) in 3 samples from Site 2 but not in the NAS reference. Cadmium was also detected at 1.2 to 2.0 mg/L. Both mercury and cadmium were dismissed as a concern due to the low levels. No technical justification was given.

The report fails to make conclusions on the horizontal and vertical extent of contamination. The distribution of the contamination is unclear because data from previous borings is not presented. Some of the deeper samples from the recent borings also showed the presence of contamination.

Section 2.5.2, page 75. The report fails to address airborne transport of dust and incidental ingestion of soils as potential migration/exposure pathways. It is stated that subsurface migration in the unsaturated zone may be limited. However, the depth to the top of the zone of saturation is not defined. It appears that the sediments become saturated within a few feet of the surface. The hydraulic conductivity of the sediments and the depth to the top of the uppermost transmissive zone are not discussed. This makes it difficult to determine the potential for vertical migration in the saturated zone.

The report concludes that no further investigation is warranted for Site 2. However, continuing reconnaissance is recommended due to the potential of contamination from an off-site source. This is touched on in Section 2.6, page 76. The discussion of the potential for contamination from sediments from SD-03 is unclear. It also appears inappropriate to relate the contamination at SD03 (a surface water sediment sample) to LUST clean-up objectives.

Based on the above comments, the conclusions in the report regarding Site 2 cannot be confirmed due to incomplete information, poor presentation, and questionable lab data. At a minimum, a more complete and clear presentation of the data is needed. The issues surrounding the composite background sample need to be addressed and other relevant standards need to be considered. Further work may be needed to define the full extent of contamination.

COMMENTS ON SITE 9 - PCB CONTAMINATED SOILS FROM HAZARDOUS WASTE STORAGE AREA

The site was used for storage of damaged transformers containing PCBs. Three transformers leaked fluid containing 600,000 ppm PCBs. The transformers were removed and placed in an 8' x 10' "transformer storage area" in the northeast corner of hazardous waste storage area. An approximate spill area was defined and stained soils were removed from spill area. Previous sampling took place in the spill area (6 borings following soil removal) and in the transformer storage area (2 borings).

Section 9.1.1, page 348. More information needs to be provided for the previous borings/samples. The text states that the data from the samples are included in the report. The data are not included. The logs, sample depths, and methods for the previous samples need to be provided. The detection limits for the previous samples were 4 to 5 ppm. This data may not be useful in determining if there is impact from the spill. Conclusions from the previous sampling should be discussed.

Section 9.1.3, page 348. The SI investigation was performed in the transformer storage area (8' x 10'). It was indicated that the sampling for the SI was to verify the extent of the remediation effort. However, there is no documentation of the actual soil removal and it is unclear if any removal occurred in the transformer storage area which is outside the actual spill area. This should be clarified.

Section 9.2.2, page 350. The handling of drill cuttings should be discussed.

Section 9.2.3, page 350. The concentration units for the PID readings should be specified.

Section 9.3.1, page 350. The methods, detection limits, chain of custody forms, and actual lab data sheets should be supplied.

Section 9.3.2, page 351. Although no PCBs were detected in any of the samples, the detection limits were not supplied and applicable standards were not discussed. The required Target Compound List (TCL) detection limits are 33 ppb for all Aroclors except Aroclor 1232 (67 ppb). Therefore, it is uncertain if the analyses verified that PCBs do not occur above clean-up levels. Under TOSCA, the soil cleanup standard is 10 ppm for an unrestricted access area.

Section 9.6, page 351. The report states no further investigation is warranted for the transformer storage area but an extended SI may be needed for the spill area. Because the data for the previous borings are not provided and clean-up standards are not discussed, it is unclear if the recommended number of borings is appropriate. How was the spacing of the borings determined? Are data from the previous borings being discounted due to high detection limits? If so, more of the proposed borings should be within the spill area. What will the methods and detection limits be for the proposed sampling?

Appendix 9.0, Figures. All of the figures in the appendix should have scales. The transformer storage area should be labeled on figures 9.1 and 9.3. Boring #280-7 is mislabeled on Figure 9.4.